REMARKS

Claims 1-7 and 9-51 are now pending in the application. Claims 1, 2, 13, 14, 26, 27 and 39 are amended herein. New claim 51 is added herein. Paragraph [0020] is amended herein to correct an inadvertent omission. No new matter is added. Claim 8 is cancelled herein without prejudice. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

INTERVIEW SUMMARY

The Examiner is respectfully thanked for the telephonic interview of August 8, 2006. During the telephonic interview no exhibits were given nor any demonstrations conducted. The rejection of claim 43 based on the Fuller reference was discussed. In particular, the Fuller reference lacking both a low voltage blower and a high voltage compressor was pointed out along with the fact that the Fuller reference is silent about the voltage of any of the components therein. The Examiner and applicant agreed that claim 43 is not anticipated by the Fuller reference. Independent claims 1, 13 and 25 were discussed relative to the rejections thereof. No agreement was reached as to the allowability of claims 1, 13 and 25 relative to the prior art rejections.

REJECTION UNDER 35 U.S.C. § 102

Claims 43-45 and 50 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Fuller et al. (U.S. Pat. No. 6,068,941). This rejection is respectfully traversed.

Claims 43-45 and 50 are patentable over the Fuller reference because the Fuller reference does not disclose both a low voltage blower and a high voltage compressor. Claim 43 calls for "a low voltage blower connected to the cathode inlet . . . and a high voltage compressor connected to the cathode inlet." In contrast, the Fuller reference discloses a single air delivery device that is referred to as both air blower 30 and compressor 30. Regardless of how the component is referred to, the Fuller reference uses a single component to supply all of the ambient oxidant to the fuel cell stack. That single component can be powered by an auxiliary power source, such as a battery, in the start-up sequence. The Fuller reference, however, does not disclose the voltage of blower/compressor 30. In fact, the Fuller reference appears to be completely silent about the voltage of the blower/compressor 30 and any other components. Thus, it is respectively submitted that the Fuller reference does not disclose a low voltage blower and a high voltage compressor as called for in claim 43 and that claim 43 is patentable. Claims 44, 45 and 50 all dependent from claim 43 and, therefore, for at least the same reasons stated above the reference to claim 43 are also patentable over the Fuller reference. Accordingly, withdrawal of the instant rejection is requested.

REJECTION UNDER 35 U.S.C. § 103

Claim 46 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller et al. in view of Thomas et al. (U.S. Pat. No. 5,670,266). Claims 47 and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller et al. in view of Stuhler et al. (U.S. Pat. No. 6,612,385). Claim 49 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller et al. in view of Zhang et al. (U.S. Pat. Pub.

No. 2004/0131898). These rejections are respectfully traversed. Notwithstanding, claims 46-49 all depend from 43 and, therefore, for at least the same reasons stated above with reference to claim 43 are also patentable over the prior art of record. Thus, withdrawal of the instant rejection is requested.

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stuhler et al. in view of Fuller et al. This rejection is respectfully traversed.

Claims 1-12 are patentable over Stuhler in view of Fuller because neither reference discloses, teaches or suggests the operating of a low voltage blower with a low voltage power source and the simultaneous operation of a high voltage compressor with a voltage output of a fuel cell stack as called for in amended claim 1. Amended claim 1 calls for "operating the low voltage blower with the low voltage power source for supplying oxygen to cathode inlet fuel cell stack . . . and supplementing the quantity of oxygen supplied . . . when said voltage output is sufficient to begin driving the high voltage compressor by simultaneously operating a high voltage compressor with said voltage output of the fuel cell stack and the low voltage blower with the low voltage power source." Thus, in claim 1 the start-up of a fuel cell system begins with the use of a low voltage blower to supply oxygen to a cathode inlet. As the voltage produced by the fuel cell stack increases using the oxygen supply by the blower, the quantity of oxygen can be supplemented by the use of a high voltage compressor driven by the voltage output of the fuel cell stack. The high voltage compressor can operate simultaneously with the low voltage blower as the start-up of the fuel cell system continues.

In contrast to the subject matter of claim 1, the Stuhler reference appears to disclose a single air source (compressor 2) that can be powered by a starter battery and a fuel cell stack. The motor that drives compressor 2 can have a single winding that is driven by the same voltage and a converter is utilized to modify the voltage of the start-up battery and of the stack to match the drive voltage of the motor, as shown in the embodiment of Fig. 1. In the embodiment shown in Fig. 2, the motor has two separate windings that are each matched to one of the voltage outputs of the starter battery and the fuel cell stack. The Stuhler reference, however, does not disclose the use of a low voltage blower nor the simultaneous operation of both a low voltage blower and a high voltage compressor during a start up of the fuel cell system. Additionally, the Stuhler reference discloses that compressor 2 is powered by either the starter battery or the fuel cell stack but not both at the same time. Throughout the Stuhler reference it is plainly stated that the switching mechanism interrupts the power supply from one power source to engage the power supply from the other power source. The switching does not allow for both power sources to be used simultaneously to drive components to supply oxidant to the fuel cell stack.

The Fuller reference does not make up for the shortcomings in the Stuhler reference. Rather, as stated above when referring to claim 43, the Fuller reference does not disclose a low voltage blower. Additionally, the Fuller reference does not disclose a simultaneous operation of both a low voltage blower and a high voltage compressor. Thus, it is respectfully submitted that one skilled in the art would not be motivated to simultaneously use both a low voltage blower and a high voltage compressor as called for in claim 1. Accordingly, for at least this reason, it is

respectfully submitted that claim 1 is patentable over the Stuhler reference in view of the Fuller reference. Claims 2-12 all depend from claim 1 and, therefore, for at least the same reason stated above with reference to claim 1 are also patentable over prior art of record. Thus, withdrawal of the instant rejection is requested.

Moreover, claims 2-6 all call for additional subject matter relating to the applying of the electrical load to the fuel cell stack with the compressor. It is respectfully submitted that the prior art of record is silent about how such power is being applied. In fact, the only reference applicant can find to operation of the compressor with the fuel cell stack is in the Stuhler reference wherein the power supply is switched from one source to the other by interrupting the first source and engaging the second source. There does not appear to be any disclosure about how such electrical loading is increased with the compressor over time. Thus, for these additional reasons it is respectfully submitted that claims 2-6 further define patentable subject matter and withdrawal the instant rejection as requested.

Claims 13-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stuhler et al. in view of Fuller et al. and further in view of Zhang et al. This rejection is respectfully traversed.

Claims 13-24 are patentable over Stuhler in view of Fuller and further in view of Zhang because none of these references either alone or in combination disclose a start-up of a fuel cell system wherein a fuel cell stack begins producing a voltage utilizing existing oxygen contained in the cathode side of the fuel cell stack and hydrogen introduced into the anode side. Claim 13 calls for "introducing hydrogen to the anode inlet of the fuel cell stack . . . producing a voltage with the fuel cell stack utilizing the

existing oxygen contained in the cathode side of the fuel cell stack and the hydrogen introduced to the anode inlet; operating the low voltage blower with the voltage produced by the fuel cell stack . . . and increasing voltage produced by fuel cell stack over time." Thus, in claim 13 a fuel cell stack is started up by utilizing existing oxygen that is contained in the cathode side in conjunction with hydrogen that is introduced to the anode inlet. The oxygen is not forced into the fuel cell stack to being producing voltage with the fuel cell stack. Once voltage begins being produced, a low voltage blower can be powered by the voltage produced by the fuel cell stack for supplying additional oxygen that allows for the voltage being produced by the fuel cell stack to increase over time.

In contrast to the subject matter called of claim 13, the Stuhler reference appears to be completely silent about starting up a fuel cell stack utilizing existing oxygen contained in the cathode side of the fuel cell stack and hydrogen introduced into the anode inlet. In fact, applicants can find no such reference to this type of starting up of the fuel cell stack in the Stuhler reference. Additionally, the Fuller reference also appears to be silent with regards to the start up of the fuel cell stack utilizing existing oxygen contained in the cathode side. Rather, the Fuller reference specifically discloses the starting up of the fuel cell stack by supplying the oxidant in a limited flow of air so that the rate of oxidation of fuel is sufficiently low so as to not raise the temperature of the cells. See at least column 3, lines 7-13 of the Fuller reference. Thus, the Fuller reference does not contemplate the use of existing oxygen in the cathode side of the fuel cell stack to begin producing the voltage. Furthermore, the Zhang reference also appears to be completely unconcerned about the starting up of the fuel

cell stack much less the use of existing oxygen in the cathode side of the fuel cell stack as called for claim 13. Thus, it is respectfully submitted that the prior art of record appears to be entirely silent about the subject matter called for in claim 13. For at least this reason, it is respectfully submitted that claim 13 is non obvious and patentable over the prior art of record. Claims 14-24 all depend from claim 13 and, therefore, for at least the same reason stated above with reference to claim 13 are also patentable over the prior record. Thus, withdrawal of the instant rejection is requested.

Claims 25-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stuhler et al. in view of Fuller et al. and Zhang et al. and further in view of Pearson et al. (U.S. Pat. Pub. No. 2004/0126632). This rejection is respectfully traversed.

Claims 25-42 are patentable over Stuhler in view of Fuller and Zhang and further in view of Pearson because none of the references either singularly or in combination teach, suggest or provide motivation to one skilled in the art to use a low voltage blower that is powered by fuel cell stack to supply oxygen to the fuel cell stack in a stand-by mode and using a high voltage compressor to supply oxygen to the fuel cell stack when operated in a normal mode. Claim 25 calls for a "operating a fuel cell stack in a stand-by mode . . . including: . . . selectively operating the low voltage blower with the voltage of the fuel cell stack to supply oxygen to the cathode inlet of the fuel cell stack via the a low voltage blower; and operating the fuel cell stack in a normal mode . . . including supplying oxygen to the cathode inlet of the fuel cell stack via the high voltage compressor." Thus, in claim 25 a stand-by mode of operation is realized by selectively operating a low voltage blower with the voltage of the fuel cell stack to supply oxygen

while a normal operating mode is realized by supplying oxygen to the cathode inlet of fuel cell stack with the high voltage compressor.

In contrast to the subject matter called from claim 25, the prior art of record does not teach, suggest or provide motivation to utilize both a low voltage blower and a high voltage compressor in a fuel cell system to operate a fuel cell stack. Rather, as stated above the Stuhler reference discloses a singular compressor that can be powered by multiple power sources. The Stuhler reference, however, does not disclose the use of both a low voltage blower and a high voltage compressor as called for. Also similarly, the Fuller reference discloses a single oxygen supply device. The supply device, however, does not specify a particular voltage level. Additionally, the Fuller reference does not disclose both a low voltage blower and a high voltage compressor as called for. The Zhang reference also fails to disclose use of a low voltage blower and a high voltage compressor. Finally, the Pearson reference also fails to disclose a low voltage blower and a high voltage compressor. Rather, the Pearson reference appears to disclose the use of a singular oxygen supply device, compressor 40, to supply air to stack 10. See at least paragraph [0035] of the Pearson reference.

Thus, it is respectfully submitted that none of the references disclose, teach or provide motivation to one skilled in the art to utilize multiple air supply devices that include both a low voltage blower and high voltage compressor. Accordingly, for at least this reason it is respectfully submitted that there is no motivation provided to one skilled in the art to operate a fuel cell system in a stand-by mode with a low voltage blower and in a normal mode with a high voltage compressor as called for in claim 25. For at least this reason, it is respectfully submitted that claim 25 is patentable over the

prior art of record. Claims 26-42 all depend from claim 25 and, therefore, for at least the same reasons stated above with reference to claim 25 are also patentable over the prior art of record. Accordingly, withdrawal of the instant rejection is requested.

Furthermore, claim 26 is also patentable over the prior art of record because the prior art of record does not teach, disclose or provide motivation to simultaneously operate the high voltage compressor and the low voltage blower with the voltage output of the fuel cell stack. Claim 26 calls for "supplementing the quantity of oxygen supplied to the cathode inlet of the fuel cell stack when said voltage output is sufficient to begin driving the high voltage compressor by simultaneously operating the high voltage compressor and the low voltage blower with said voltage output of the fuel cell stack." Thus, in claim 26 when the voltage output of the fuel cell stack is sufficient, the starting up of fuel cell stack includes simultaneously providing oxygen with both the high voltage compressor and the low voltage blower.

In contrast to subject matter called for in claim 26, the prior art of record does appear to disclose, suggest or motivate one skilled in the art to simultaneously operate both the high voltage compressor and the low voltage blower. As stated above with reference to claim 1, neither the Stuhler nor Fuller references disclose that subject matter. Additionally, the Zhang reference appears to only disclose the use of a singular oxygen supply device and, is silent about any voltage of the supply device. Additionally, the Pearson reference also discloses the use of only a singular oxygen supply device, compressor 40, as shown in the figures of Pearson. Thus, for at least this reason it is respectfully submitted that none of the prior art of record teaches, suggests or provides motivation to one skilled in the art to simultaneously operate both a high voltage

compressor and a low voltage blower to supply oxygen to fuel cell stack as called for in claim 26. Thus, it is respectfully submitted that claim 26 is further patentable over the prior of record for at least these reasons. Claims 27-37 all depend from claim 26 and, therefore, for at least the same additional reason related to claim 26 are also patentable over the prior record. Thus, withdrawal of the instant rejection is requested.

NEW CLAIM

Claim 51 is added herein. It is respectfully submitted that claim 51 is patentable for at least the same reasons stated above with reference to claim 26. In particular, claim 51 call for "simultaneously operating a high voltage compressor and a low voltage blower with the voltage produced by the fuel cell stack." Thus, allowance of claim 51 is requested. Claims 14-18 all depend from claim 51 and, therefore, for at least the same reasons stated with reference to clam 51 are further patentable over the prior of record. Thus, allowance of claims 14-18 is requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner

believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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